



From thinking too little to thinking too much: a continuum of decision making

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Due to the sheer number and variety of decisions that people make in their everyday lives—from choosing yogurts to choosing religions to choosing spouses—research in judgment and decision making has taken many forms. We suggest, however, that much of this research has been conducted under two broad rubrics: The study of thinking too little (as with the literature on heuristics and biases), and the study of thinking too much (as with the literature on decision analysis). In this review, we focus on the different types of decision errors that result from both modes of thought. For thinking too little, we discuss research exploring the ways in which habits can lead people to make suboptimal decisions; for thinking too much, we discuss research documenting the ways in which careful consideration of attributes, and careful consideration of options, can do the same. We end by suggesting that decision makers may do well, when making any decision, to consider whether they are facing a ‘thinking too much’ or ‘thinking too little’ problem and adjust accordingly. © 2010 John Wiley & Sons, Ltd. *WIREs Cogn Sci* 2011 2 39–46 DOI: 10.1002/wcs.90

INTRODUCTION

The study of decision making is intricately intertwined with the study of thinking; indeed, two of the most studied approaches to decision making have at their core the notion of *thought*—one stream which focuses on how decisions can be improved through more thinking and careful analysis,¹ the other which focuses on how people often think too little, relying instead on heuristics to guide their decisions.² In this article, we focus on bringing together in one framework the different streams of research in psychology and decision making that explore these two ways of making decisions: Thinking too little (as when people rely on habits), and thinking too much (as when decision analysis is taken too far). We show that the study of these two modes—under many different guises—is prevalent in the decision-making literature, focusing in particular on the different kinds of errors that each mode of thought can induce, which vary substantially between the two modes. Next, we discuss

research that offers guidance to decision makers in determining the ‘correct’ amount of thought required for a given decision. More broadly, we suggest that it may be useful for both scholars and laypeople to consider whether, when they are making some decision, they are facing a ‘thinking too little’ problem or a ‘thinking too much’ problem.

THINKING TOO LITTLE

While we will focus in this section on the disadvantages of ‘thinking too little’, we of course acknowledge that there are enormous benefits to the human ability to make decisions quickly and habitually—people would not be able to chew gum, drive, and listen to music simultaneously unless they were skilled at automating decisions.^{3–5} Indeed, in many cases, using heuristics to guide judgment and behavior is an efficient means of negotiating complex decisions and environments,⁶ and the sheer number of decisions people must make every day in some sense requires that they are ‘cognitive misers’⁷—without this tendency, people might never get out of bed as they endlessly considered whether to put their left or right leg on the floor first. As a result, it is not surprising that a large percentage of the decisions people make each day are habitual.^{8,9} At the same time, however, such habitual

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decision making can have deleterious consequences when taken to the extreme, when people apply well-learned rules to situations in which they would be better off reverting to thinking a little bit more.

Perpetuating Bad Habits

In one clever study that used a modified version of an existing paradigm,¹⁰ Neal et al.¹¹ measured participants' popcorn eating habits while watching movies at a movie theater, and identified people with different habits: those who rarely ate popcorn, those who sometimes did, and those who ate popcorn frequently. All participants were asked to watch a movie and were allowed to eat as much popcorn as they wished while they watched—some participants, however, were given fresh popcorn, while others were given less appetizing, week-old, stale popcorn. Those who rarely and sometimes ate popcorn ate less of the stale than the fresh popcorn, as we might expect from a thoughtful decision maker; those who habitually ate popcorn, however, showed no difference, throwing the same amount of popcorn into their mouths as they watched—whether it was stale or not. In contrast, in a condition in which participants were not distracted by a movie and thus could think more about what they were eating, all participants—regardless of their habits—ate less of the stale than fresh popcorn. Thus, habitual behavior that often leads to utility can lead to disutility when those habits that are followed are less than optimal.

Indeed, more broadly, the current obesity epidemic may be driven in part by humans continuing to eat based on preferences that were at one time evolutionarily advantageous—given scarcity of food, eating everything available was once wise—rather than consideration of how much and what kind of food is actually optimal.^{12,13} Even at the scale of just one human lifetime, many people approaching middle age continue to eat the same amount of food despite engaging in much less exercise than they did at age 18, with disastrous consequences for their waistlines. In short, for many decisions, we rely on our existing habits without thinking *enough* about the basis for those habits. This can lead to suboptimal behavior, as when people mindlessly continue to engage in habits even when those habits are costly.

In another demonstration of how habits can lead to suboptimal behavior, Smalley et al.¹⁴ show that people who have already begun taking medications who then receive a warning about serious side effects ignore those warnings, while those new to the medication take the warning into account. In another particularly compelling demonstration, experienced

parents—those with older children who had some personal experience with giving their kids cold medicines—were less likely to report complying with the revised recommendation of the US Food and Drug Administration that children aged under 2 years not be given over-the-counter cold medicines.¹⁵ Although there may be some good reason for this behavior—for example, if one has taken medication without side effects one may be less susceptible to them—the process is more general. In a series of careful experiments, Barron et al.¹⁶ show that even when people are strongly warned about the risks of some course of action, they continue to engage in that action much more if they happen to have had safe experiences with it than if not. Thus, someone who fails to use a condom and does not experience negative consequences may begin to make this mistake habitually, as though the luck at Time 1 is related to the risk at Time 2.¹⁷ Thus again, behavior that becomes habitual may not reflect rational or 'better' preferences.

Perpetuating Meaningless Habits

Of course, in many cases habits are formed as a result of actual positive experiences. Even in these cases, however, people may continue to make the same habitual decision not on the basis of a real preference, arrived at through sampling of different options before deciding on a favorite. Indeed, there is an assumption that people's habits have developed as a result of their learning their true preferences over time, but in fact people's preferences can be formed somewhat arbitrarily, and their subsequent behavior can then be driven by that initial arbitrary starting point.¹⁸ Thus, many habitual choices that appear to reflect people's true preferences may be formed arbitrarily and do not in fact reflect the true underlying utility of that choice. Take the case of a favorite pizza place: When Leif moves to a new city, he *could* sequentially sample each local pizzeria, weighing the pros and cons of each slice, winnowing down the consideration set, and then deciding on a favorite, which becomes his habitual hangout. Instead, when craving pizza the night after he moves in, Leif might instead, stopping in his mail room, find a flyer for a pizza joint one block north of his building, call them, order pizza, enjoy it, and then make that vendor *his* vendor until he again moves to a new city. Indeed, Leif may even recommend it to his friends and swear by the establishment's crust. Of course, it may be the case that Leif would actually prefer a pizza place one block south, or west, or east, but once his initial preference is in place—despite its relatively low utility—he may continue to make that choice over time.^{19,20}

Thus, even when habitual behavior does not have direct negative consequences (as in the example of eating stale popcorn), it may have costs in the form of foregone utility, as people continue to engage in a behavior that does not actually maximize their utility.

THINKING TOO MUCH

These errors, a result of thinking too little, seem to suggest an obvious solution: Think more. Indeed, for many decisions, people do engage in at least some rudimentary form of decision analysis, weighing the pros and cons and considering different attributes when comparing options, in order to arrive at a solution. Unfortunately, as the research reviewed below suggests, thinking more often leads to thinking *too* much, a mode of thought that comes with its own costs. Again, we acknowledge that for many decisions, careful analysis of the available options is wise and can improve decision making; but here we focus on the particular errors that arise when such careful analysis is taken too far.

Considering Too Many Attributes

When people attempt to consider all relevant attributes, they may as a result erroneously give weights to attributes that they do not actually value highly; in buying a flat screen TV, for example, a consumer may only care about screen size to watch DVDs, but when ‘screen-in-screen’ capabilities are raised by a salesperson, consumers suddenly factor this into the decision—even though they do not watch television, where this feature would actually be a relevant attribute. Fischhoff et al.²¹ showed participants lists of causes for why a car failed to start (such as ‘battery charge insufficient’); including one cause that was a catch-all ‘all other problems’ label; they found that battery charge was weighted highly when listed as a distinct cause, but when it was not listed (and thus was an unnamed component of the ‘all other reasons’ category), the catch-all category failed to receive as much weight as it should have if participants had incorporated the weight they previously assigned to the battery charge cause.²² As consumers continue to shift their purchase decisions to the internet, where retailers can change displays to highlight different attributes nearly instantaneously, these effects of thinking too much—by considering too many, and somewhat irrelevant attributes—may become increasingly widespread.^{23–25}

Indeed, these seemingly simple changes in how attributes are presented impact not just consumer decisions, but even dating decisions. Martin and Norton²⁶

presented participants with several possible dating options, each of whom had been rated on a number of dimensions, and asked participants to indicate which of those options they found most appealing. However, they varied how the information about those partners was presented. All participants saw ratings for each potential romantic partner’s overall appearance, but some participants additionally saw ratings for each of six personality traits (intelligence, sense of humor, common sense, kindness, generosity, and friendliness)—thus highlighting the relative importance of personality compared with appearance. Other participants instead simply saw a single overall rating for personality—thus equating the importance of appearance and personality. Those in the former condition, in which all six personality traits were listed, came to see personality as much more important in choosing a partner, and as a result gave much more weight to personality characteristics in making their dating choice. Interestingly, this tendency was even true for a separate set of participants for whom the six traits used were those that they had previously indicated were the six most important to them in a date’s personality, such that changing the presentation of attributes impacted people’s professed stable preferences, making them more or less likely to value personality depending on the number of traits shown.

Considering Attributes at All

Even aside from the impact of considering any one attribute more than is warranted, the general impact of considering attributes at all, of breaking decisions down into their constituent parts, can have deleterious consequences for decision making. In a now-classic study, Wilson and Schooler²⁷ showed that merely asking participants to think about reasons for their ratings of different jams interfered with those participants’ preferences, as compared with participants who were only asked to form preferences; indeed, asking participants to explain their choices led their rankings to diverge from the actual quality of those jams, as determined by experts. More broadly, because participants are often unaware of their true sources of their preferences,²⁸ asking them to explain their choices in rational ways can change their preferences and impact their decision making for the worse.^{29,30} In a study by Lee et al.,³¹ for example, participants who were instructed to use their emotions to form preferences demonstrated greater preference consistency over time than those asked to deliberate while making their choices. Similarly, allowing people to form their preferences in the absence of deliberation—relying on unconscious

thought instead—can improve the quality of their decision making.³²

In addition, some kinds of preferences may be particularly susceptible to interference from thinking too much. Preferences for *experience* goods—those products that are judged by the holistic impression they make, and the feelings they evoke—are very likely to be contaminated by overthinking in comparison to *search* goods—those products that can be judged on objective attributes: It is easier to break televisions down into their constituent attributes than puppies.^{33–35} Indeed, when people try to form preferences about experience goods without being able to experience them first-hand, they often mispredict their satisfaction.³⁶ Rather than trying to *experience* the products (the kind of ‘thinking’ they actually need to make good decisions for such goods), they base their preferences on careful consideration of attributes that do not actually inform their choices; for search goods, on the other hand, using these attributes does lead to optimal choices. Perhaps nowhere is the problem of thinking too much about experience goods more evident than in the domain of online dating, in which consumers looking for their soul mate are forced to search for people the way they examine digital cameras, using drop-down menus to indicate their preferences—whereas direct experience is crucial for determining whether someone is a good match.^{37,38}

Considering Only Justifiable Attributes

More generally, when people attempt to make ‘rational’ decisions, they might have a tendency to focus on making decisions that *feel* right, rather than making decisions that reflect their true preferences. Kahneman et al.’s³⁹ distinction between *decision utility* and *experienced utility* is useful: Decision utility is the subjective feeling of the certitude that people feel while making a decision, while experienced utility is the actual hedonic utility gained as the outcome of some decision. When we consider both of these sources of utility, we can conjecture that thinking more deliberately will cause people to focus too much on the simpler and more immediate objective—decision utility—and in the process underweight the true objective of their choice—its experienced utility. Some evidence for this idea can be found in research exploring ‘reason-based choice’, in which people seek to make decisions that they can easily explain to themselves, giving themselves the feeling that they have made a good decision.⁴⁰

In addition to being influenced in their decision making by the desire to make decisions that they can explain to *themselves*, people’s decision making

is also adversely impacted by their desire to make decisions that they can easily explain and justify to *others*.⁴¹ Although making people accountable to others in this fashion can in some cases lead to better decision making, it can also lead people to merely be more careful in justifying their biased decisions. In one investigation, decision makers motivated to favor candidates for jobs and college admission on the basis of those candidates’ race and gender were careful to claim that their decisions were uninfluenced by race and gender, instead citing other attributes of their preferred candidates to justify their decisions; making these decision makers accountable to others did little to decrease bias, but rather made them even more likely to cite ‘safer’ attributes to justify their decisions, such that others were less likely to detect their bias.⁴² Most troublingly, they then carried forward these altered preferences to subsequent decisions, suggesting that this process had changed their underlying preferences for these attributes.⁴³

Considering Too Many Options

Finally, although the above research on thinking too much has focused on how including too many attributes, or focusing on the wrong kinds of attributes, can adversely impact decision making, another stream of research suggests that thinking about too many options can also have other negative effects. Again, a true decision analysis would involve a decision maker considering each available option before making a decision, in order to fully calibrate her preferences. First, many decisions have diminishing payoffs for considering each option: In the famous ‘secretary problem’, for example, a decision maker’s optimal strategy when asked to select a secretary from a pool of 100 is to consider just 37, and then select the next relatively best option.⁴⁴ Even more problematically, considering too many options can have the unfortunate side effect of leaving people unable to choose at all. In Iyengar and Lepper,⁴⁵ supermarket shoppers who were able to select from an array of 24 flavors of jam were actually less likely to buy a jam than those who selected from an array of just six flavors; despite the presumption that an increase in variety should have meant that more people found a jam that better matched their taste, considering too many options proved paralyzing.⁴⁶ In addition, choosing from such wide arrays leads to less satisfaction with subsequent choices,⁴⁵ suggesting that even when people do choose from a larger assortment, the process of considering too many options undermines the consumption utility they experience. In one study, college students searching

for a job who were ‘maximizers’—decision makers who seek the best possible option through an exhaustive review of all options—obtained higher starting salaries, but were *less* satisfied with their ultimate decision, than ‘satisficers’—those who search for a good option for a reasonable period of time and then end their search when they find one.^{47,48} To return to our example of Leif’s favorite pizza, we do not suggest that he should exhaustively try each and every pizza in the city, but rather that his belief that the first one he tried dominates all others—even though that first selection was random—might be better informed by his trying at least a few more options before choosing his lifetime preference. Thus, while considering only one option may be unwise, in some cases, decision makers who consider relatively fewer rather than more options may end up subjectively happier with their decisions.

Even aside from considering too many options, the mere act of choosing between options has been shown to have potential negative consequences for the decision maker, given the regret and dissonance that can result.^{49–51} In one particularly compelling demonstration, parents who made the choice to discontinue their infants’ life support expressed more lingering grief and distress than those who had the decision made for them by a medical professional.⁵² Thus, although one view suggests that thinking about more options—and thinking more carefully about those options—leads to better decisions, both these kinds of thinking can lead to decreased utility.

EMPIRICAL INVESTIGATIONS OF THE TRADEOFFS BETWEEN THINKING TOO LITTLE AND THINKING TOO MUCH

Many of the investigations we have reviewed have as their focus the impact of one particular kind of thinking on one particular behavior—habits on eating, attributes on choice—while comparatively few consider directly a crucial question: Under what conditions, and in what situations, does thinking too much or thinking too little lead to good and bad outcomes? More broadly, can we make *any* normative claims based on existing research about when more or less thought is optimal? Part of our goal in this article is to encourage this kind of research—in addition, however, there are two intriguing investigations which have already begun to explore this important question, both of which have as their goal raising concerns about overgeneralizing the benefits of one mode of thought.

First, a large and growing body of research examines people’s ability to glean people’s personality

from viewing very thin slices of their behavior—from predicting a teacher’s final ratings from mere seconds of their classroom performance⁵³ to using judgments of the competence revealed in politicians’ photographs to predict election winners.⁵⁴ But are people able to accurately glean *all* information about others on the basis of such sparse information? In one investigation, while people were quite good at detecting some personality traits after brief exposures (e.g., extraversion and intelligence), accuracy about other important traits (such as agreeableness and openness to experience) improved with more information.⁵⁵ Second, although research demonstrates people’s ability to make better decisions while thinking unconsciously (e.g., while distracted) than thinking consciously,³² one recent investigation demonstrates that thinking more can improve decision making, particularly when tasks required more complex mathematical computation.⁵⁶ Thus in both cases, people’s impressive ability to rely on snap judgments or unconscious thought—thinking ‘too little’—to make accurate judgments is bounded; in one case by the kind of judgment being performed, and in the other, the kind of task.

CONCLUSION

We have attempted to illustrate the very different kinds of decision errors that arise when decision makers either think too little or think too much. Of course, our list is far from exhaustive, but even the relatively few examples reviewed here demonstrate the wide range and variety of errors that occur under these two conditions. At the same time, our framework calls out for a prescriptive statement—if thinking too little and thinking too much are both problematic, then what are decision makers to do? What is the ‘just right’ amount of thinking? The research reviewed in the previous section offers some specific instances of when more thinking might be preferable, but what other criteria might prove relevant?

One interesting possibility is that experience with making decisions helps people to find the right balance of thinking too much and thinking too little, and thus experience may be a way to improve decision making. One obvious proxy for experience with decision making is simply age: The older the decision maker, the more decisions made. Some research does suggest that older individuals are in fact less likely to consider a wide range of information—avoiding negative information and attending more to positive information⁵⁷—which might suggest they are less susceptible to errors that arise from thinking too much. At the same time, age brings with it a decline in the efficiency of deliberative abilities; however,

some research suggests that despite this decrease in efficiency, older adults are better at allocating attention to relevant details while screening out less relevant information.^{58–60} Still, older consumers are more brand loyal,⁶¹ which may suggest that they sometimes think too little as well, over-relying on habitual purchases of familiar brands rather than considering new alternatives. In short, rather than improving decision making overall, age may simply change the domains in which thinking too much and thinking too little apply, thus changing the errors that arise from both modes of thought. Aside from the fact that a prescriptive statement of ‘wait until you are older to make decisions’ is not very useful, this research suggests that, if getting older does not make a large difference in improving people’s ability to think the right amount, then experience in general may not be the best path to better decisions.

Still, a second possibility is that, as people gain experience with a particular *type* of decision, they optimize the thought process they bring to bear. For instance, we may rent many apartments, buy several houses, and even marry a few spouses, but the total number of experiences remains low, and worse, as the decisions become more important the amount of experience we have is often decreasing along with our opportunity to learn how much to think, and what to think about. For those decisions that people have made many times—like renting an apartment—we suggest that decision makers should be on the lookout for thinking too little: ‘Are the attributes I have

grown accustomed to using to evaluate the apartments I rented in New York the correct attributes to being to bear when renting in San Francisco?’, because using prior rules may lead people astray when environments differ by too great an extent.⁶² And for decisions made for the first time—such as getting married—people may be tempted to go with their gut feeling, asking, ‘Is this my soul mate?’, when it may be better to bring at least a minimum level of decision analysis to bear, asking ‘Do we share the same attitudes towards spending money?’, for example, an important predictor of relationship satisfaction.⁶³

More generally, as we suggested at the beginning of this article, the decision maker might be wise to ask *both* questions—‘Am I thinking too much? Am I thinking too little?’—when making any decision, and then correcting in the other direction when the answer seems to be ‘yes’. When Goldilocks went for a walk in the forest, she came upon a house and after awhile she went upstairs to the bedroom. She lay down in the first bed, but it was too hard. Then she lay in the second bed, but it was too soft. Then she lay down in the third bed and it was just right, and she fell asleep. Given the multitude of pitfalls reviewed above that can arise from both thinking too little and thinking too much, asking these two questions—being sure not to consider too little information, but being sure not to consider too much—may help decision makers get closer to thinking the ‘just right’ amount.

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